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THE PANAMA CANAL: ITS CONSTRUCTION AND ITS EFFECT ON COMMERCE

BY JOHN W. HERBERT

Stimulated by what he saw on a recent visit to the Panama Canal the writer's desire was aroused for more information than can be derived from a short visit. The following pages are the result of his inquiries. Although making no pretense to scientific treatment they are offered in the hope that they may nevertheless prove of interest.

Our party sailed from New York early in October, 1912, on the Atlas Line steamer *Prinz August Wilhelm* for Colon. Our first stop was at Fortune Island in the Bahamas. Here we took on board forty husky negroes as stevedores to unload the ship's cargo in Colon and to reload her for her return trip. This procedure has become necessary in the West Indian and Central American trade since the construction of the canal began, as it has been found impossible to secure adequate help for this purpose at the different Central American ports.

After a day's stop at Kingston, Jamaica, we resumed our voyage, arriving at Colon on October 14. The harbor of Colon is open and exposed to easterly winds and in time of storm affords but little protection to vessels. The Government of the United States, as a part of the comprehensive scheme for building the canal, is erecting a break-water extending from the north shore two and a half miles to deep water, which, it is believed, will make a safe haven for all the ships of the world that may at any time congregate there.

History of the Isthmus. As we started on the journey across the Isthmus, I could not but recall the intensely interesting history of the country—the discovery by Columbus, his unsuccessful efforts to find a maritime channel between the two oceans, the hardships endured by that intrepid explorer, Vasco Nuñez de Balboa, who crossed the Isthmus of Darien, later called Panama, through almost impenetrable jungles and impossible swamps, whose perseverance was rewarded when, on September 25, 1513, reaching the continental divide, he saw in the distance the wide Pacific Ocean; how the stories of rich gold and silver mines to the south of the Isthmus excited the cupidity of the adventurous buccaneer, and led to the settlement of the Latin-American states by the Spaniards of four centuries ago; the repeated attempts that were made to find a strait through the continent; the building of old Panama; its grandeur and glory, its reputation for riches, which resulted in the raid of Morgan and the complete effacement of its fifteen thousand buildings. I recalled the ill-fated Darien expedition, which destroyed the hopes of the English to extend their posts to the Pacific, at the close of the seventeenth century; the hostility of the Indians to the Spaniards; the passage of the act by the Cortes of Spain, in 1814, authorizing the construction of a canal through the Isthmus and providing for the formation of a company to effect the enterprise; how, before anything was accomplished under this legislation, the restless spirit of the Latin-Americans resulted in revolution, and all the Central and South American republics were created and that rich land lost forever to Spain. With the passing of that once great world power went its cherished hope of uniting the two oceans. And then I thought of the thrilling history of these new Spanish republics; how in 1819 Simon Bolivar succeeded in having the states of New Granada, Ecuador and Venezuela join in the Confederation of Colombia, only to disrupt again in 1831, when the Isthmus of Panama became a part of New Granada; how this republic in 1838 granted to a French company the right to construct highways, railroads and canals from Panama to the Atlantic Ocean; the careful work, surveys, soundings that were made by this French company, creating optimism in the success of the venture, only to be followed eight years later by discouragements, government opposition, and defeat; how the discovery of gold in California led to such a tide of emigration from the north and east by way of the Isthmus as to demand improved methods of transportation across that narrow strip of land, resulting in the concession in 1849 by New Granada to William Henry Aspinwall, John L. Boyd Stephens and Henry Chauncey, of New York, and their associates, of the privilege of building the Panama Railroad, and the difficulties that were encountered in its construction and operation.

Shortly after the discovery of America and following the conception of its geography, the building of a canal to unite the Atlantic and Pacific was the dream and hope of Spain, Great Britain, France and the United States, each in turn. Concessions for the purpose were, again and again, made by the republics of New Granada, Colombia and Nicaragua. President Grant's first message to Congress recommended an American canal. A joint resolution was passed authorizing surveys and exploration by the Navy Department. Both the Nicaragua and Panama routes were carefully surveyed, and the Canal Commission, which had been created in 1872, reported in favor of the Nicaragua route in 1876. In the meantime, France had sent a representative to the Isthmus of Panama to make a survey of that route, and found it feasible to obtain a concession from the Republic of Colombia. Although only a partial and hurried survey was made, the scheme was reported as practicable. The glowing report of the engineers as to the cost of construction and the immense profits to be made, together with the glory of accomplishing the work, appealed to the pride of the French nation, and on the formation of the Panama Canal Company, with the noted De Lesseps at its head, a stream of gold came pouring into the coffers of the company from every nook and corner of France. Never had so important a work been undertaken with so little care and preparation. Millions were wasted owing to inadequate surveys, and countless lives were destroyed by ignoring the ordinary laws of sanitation. Plans were changed, channels diverted, excavations abandoned, fills made and deserted. The incomplete and unreliable data, on which De Lesseps acted, ignoring the reports of competent engineers, made the failure of the work inevitable. After $260,000,000 had been spent by the French company, failure was acknowledged and a receiver was appointed. It was at this juncture that the United States came to the rescue and undertook the completion of the canal. It offered the Panama Canal Company for all its rights, concessions, machinery, material, plans and surveys, including its holdings of the stock of the Panama Railroad Company, the sum of $40,000,000, that being the amount that the Canal Commission reported to be its value to the United States. The French company demanded $109,000,000, and it was not till after our Government had taken up again the consideration of the Nicaragua route and obtained a concession for it from that republic that the French stockholders determined to accept our offer.

The Spooner Bill, providing for the purchase of the canal from the French company, also authorized the making of a treaty with the Republic of Colombia, by which our Government should secure the perpetual title to and control over the canal zone. The amount to be paid to the Colombian Republic was not to exceed $10,000,000. During the pendency of negotiations with the Republic of Colombia, and while our offer of $10,000,000 was under consideration by that government, its Congress adjourned for a year without taking any action. Almost immediately thereafter and opportunely for the possible consummation of the scheme by the United States, the Panama revolution occurred. On its apparent success the United States recognized the new republic, negotiated the Hay-Bunau-Varilla Treaty, in the closing months of 1903, which was ratified February, 1904. This treaty provides among other things, as follows:

Independence of the Republic of Panama. Article I. The United States guarantees and will maintain the independence of the Republic of Panama.

Perpetual Grant of the Canal Zone. Article II. The Republic of Panama grants to the United States in perpetuity the use, occupation and control of a zone of land, and land under water, for the construction, maintenance, operation, sanitation and protection of said canal, of the width of ten miles, extending to the distance of five miles on each side of the center line of the canal to be constructed; the said zone beginning in the Caribbean Sea, three marine miles from mean low-water mark, and extending to and across the Isthmus of Panama into the Pacific Ocean, to a distance of three marine miles from mean low-water mark, with the proviso that the cities of Panama and Colon and the harbors adjacent to said cities, which are included within the boundaries of the zone above described, shall not be included within this grant.

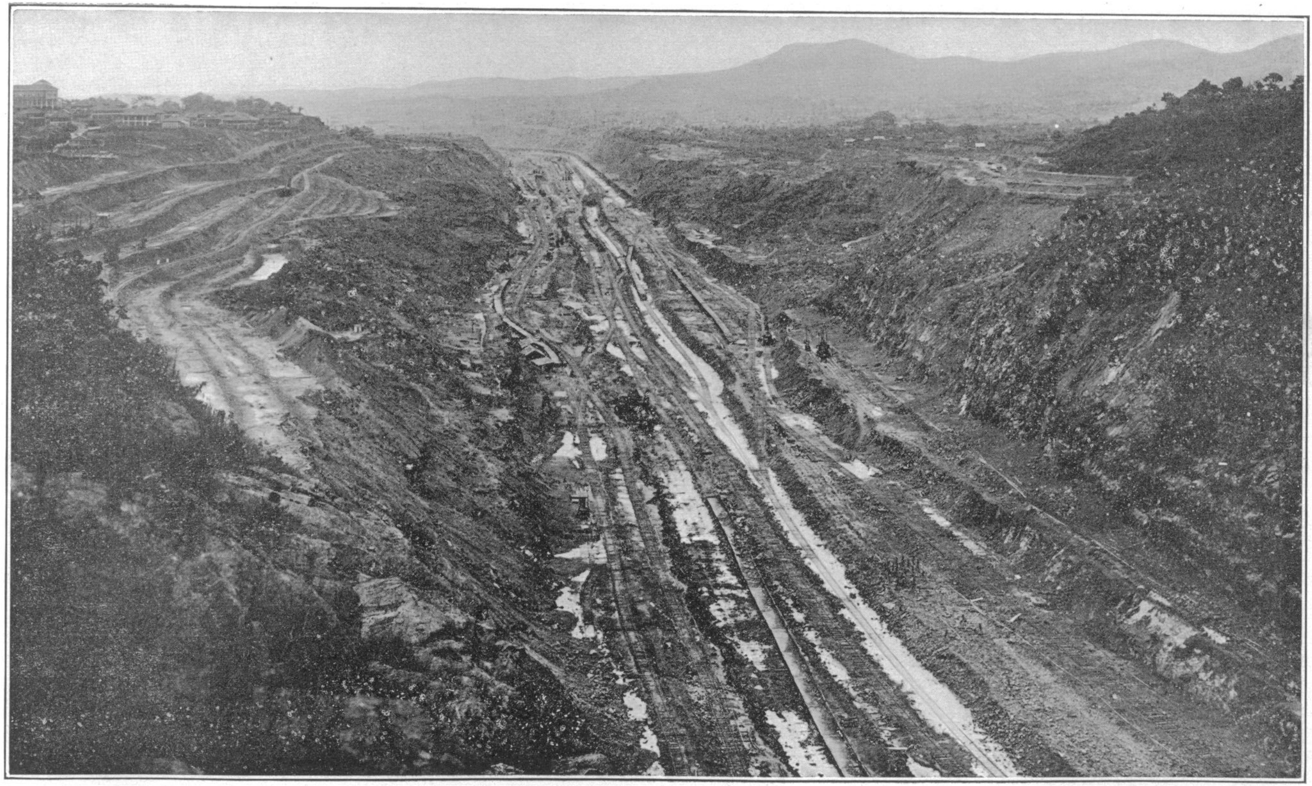
The Republic of Panama further grants in like manner to the United States all islands within the limits of the zone above described, and, in addition thereto, the group of small islands in the Bay of Panama, named Perico, Naos, Culebra and Flamenco.

Article III confers the sovereign rights, power and authority of the United States to all the territory named in Article II.

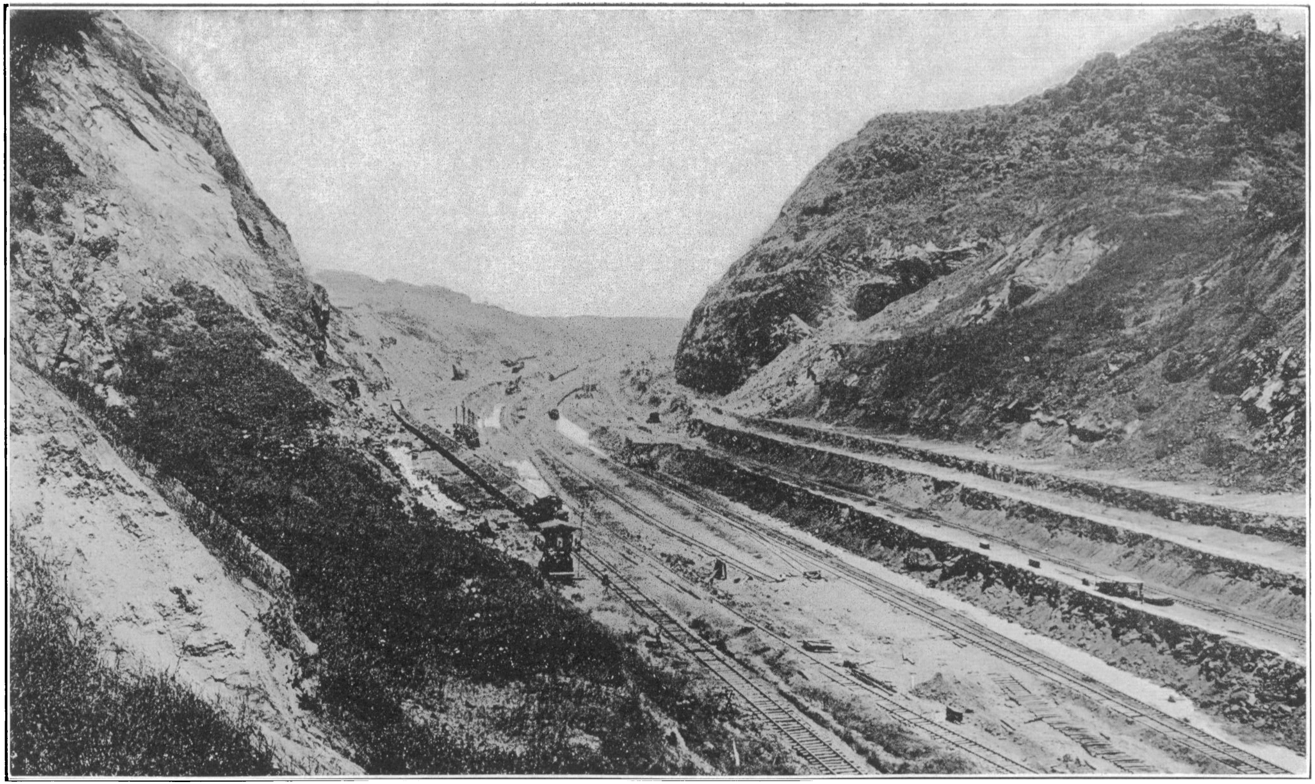
Article VII. The Republic of Panama agrees that the cities of Panama and Colon shall comply in perpetuity with the sanitary ordinances prescribed by the United States, and on failure thereof the United States has the right and authority to enforce the same.

The same right and authority are granted to the United States for maintenance of public order in the cities of Panama and Colon and the territories and harbors adjacent thereto in case the Republic of Panama should not be, in the judgment of the United States, able to maintain such order.

Article IX. The United States agrees that the ports at either entrance of the canal and the waters thereof, and the Republic of Panama agrees that the towns of Panama and Colon, shall be free for all time so that there shall be imposed or collected custom-house tolls, tonnage, anchorage, light-house, wharf, pilot or quarantine dues, or any other charges or taxes of any kind upon



View of Culebra Cut from top of Contractors Hill looking toward Colon.



Culebra Cut looking north from south of Gold Hill.

any vessel using, or passing through the canal, or belonging to, or employed by the United States, directly or indirectly, in connection with the construction, maintenance, operation of the canal, except such tolls and charges as may be imposed by the United States for the use of the canal and other works, and except tolls and charges imposed by the Republic of Panama upon merchandise destined to be introduced for the consumption of the rest of the Republic of Panama and upon vessels touching at the ports of Panama and Colon, and which do not cross the canal.

Article XIV. As the price of compensation for the rights, powers and privileges granted in this convention by the Republic of Panama to the United States, the Government of the United States agrees to pay to the Republic of Panama the sum of $10,000,000 in gold coin of the United States on the exchange of the ratification of this convention, and also an annual payment, during the life of this convention, of two hundred and fifty thousand dollars ($250,000) in like gold coin, beginning nine years after the date aforesaid.

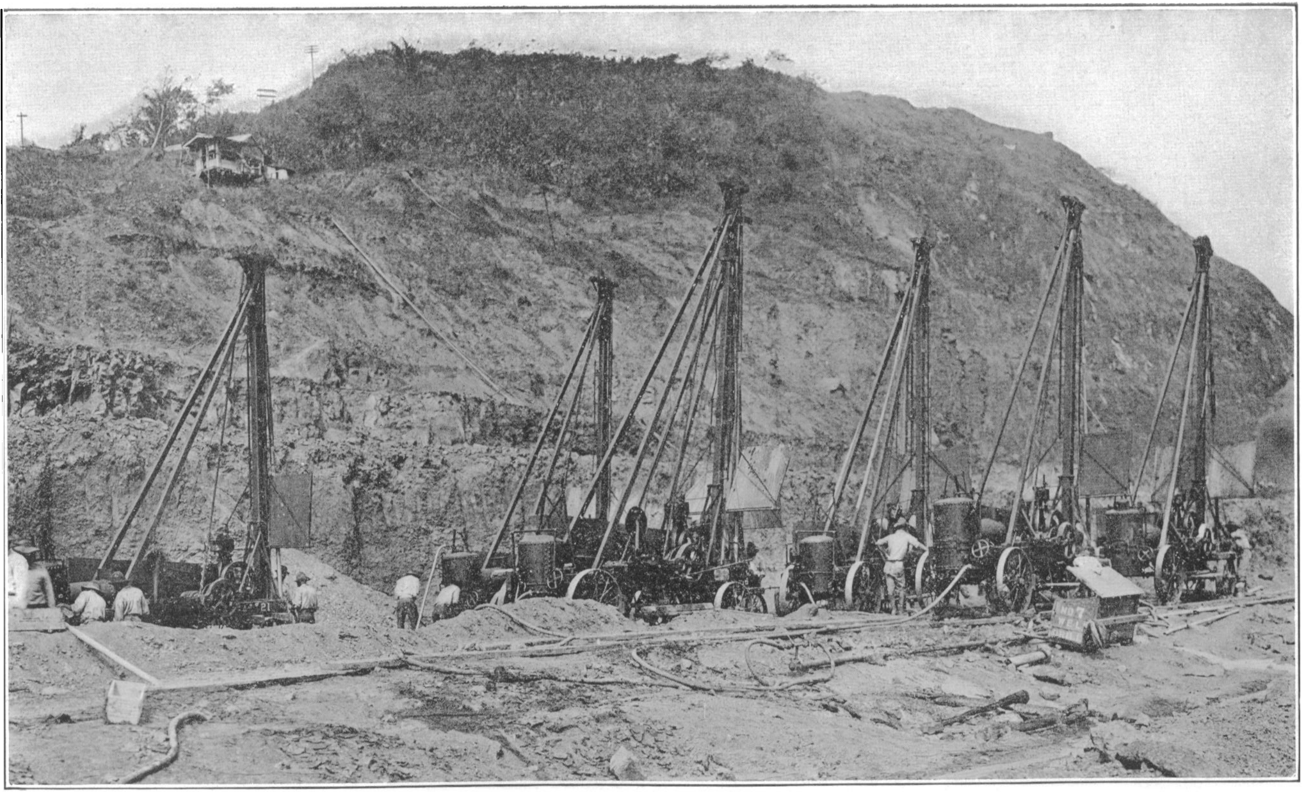
Article XVIII. The canal, when constructed, and the entrances thereto, shall be neutral in perpetuity, and shall be open upon the terms provided for by Section I of Article III, of and in conformity with all of the stipulations of the treaty entered into by the Governments of the United States and Great Britain on November 18, 1901. [This refers to the Hay-Pauncefote Treaty, "designed to facilitate the construction of the Panama Canal."]

Under the Spooner Bill President Roosevelt appointed a commission of seven members to prosecute the canal work, and on March 9, 1904, directed the Honorable William H. Taft, Secretary of War, to assume supervision of the work of the Isthmian Canal Commission. Several changes have been made in the management of the work. It is now under the full direction and superintendence of a military board of officers from the regular army, the chief being that exceptionally able engineer and man of remarkable executive ability, Col. George W. Goethals, Corps of Engineers, U. S A. He is assisted by an excellent organization. All of the officers engaged in the work have shown marked ability, untiring devotion and zealous interest in the work, and in nearly every case at great personal loss and discomfort. The rapidity and perfection of their work in all of its phases have astonished and excited the admiration of the world. Scepticism as to the success of the undertaking, one of the greatest engineering feats of the world, has given way to unquestioned confidence in its full and perfect completion.

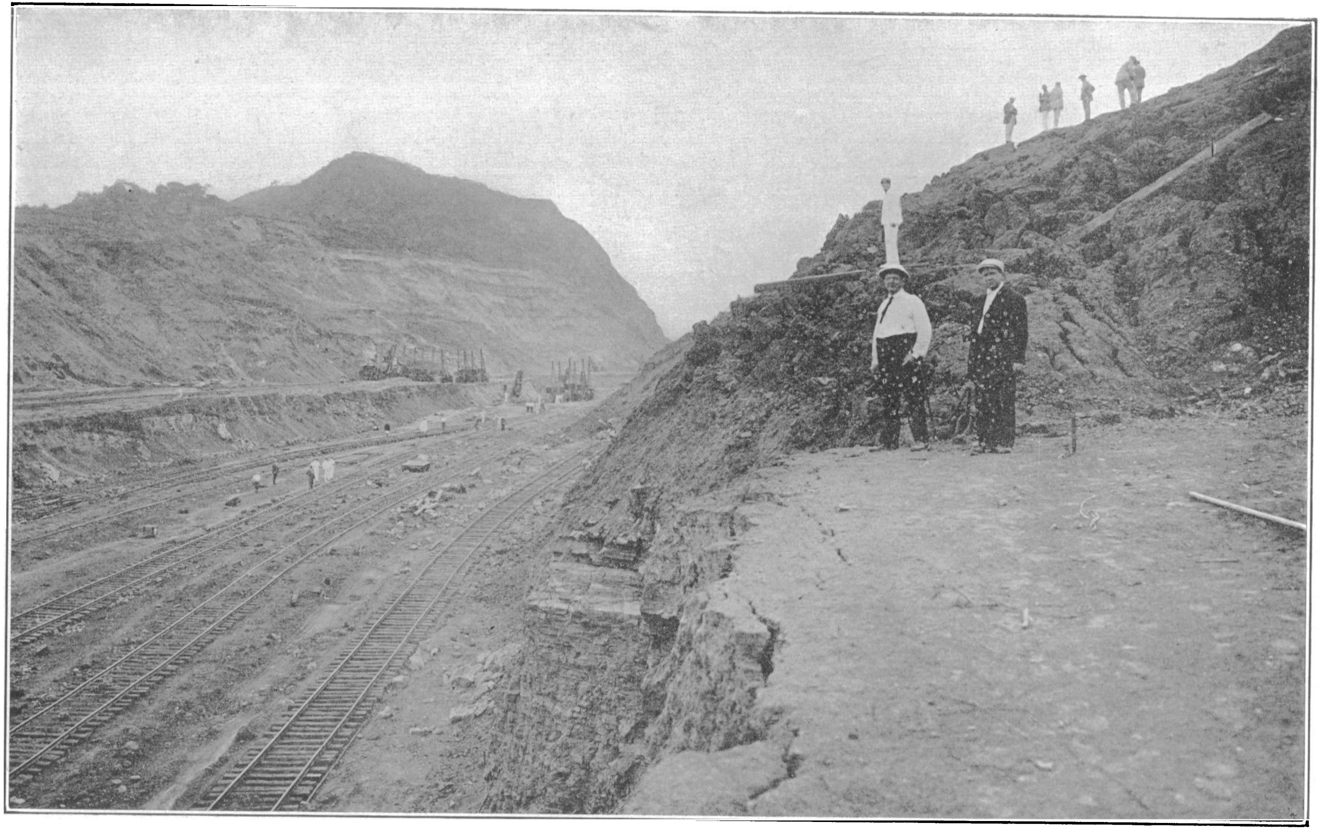
Description of the Canal (cf. map on p. 247). The Canal Zone, as has been stated, is a strip of land ten miles wide, extending from the Atlantic to the Pacific. It contains 448 square miles. The canal traverses this zone from Colon to Panama, in a southeasterly direction. It is not generally known that Panama is 22 miles east of a line drawn due south from Colon. The entire length of the canal is 50 miles, of which 10 miles is outside of the shore lines.

In passing through the canal from the Atlantic, vessels will enter the channel in the harbor at Colon and proceed to the locks at Gatun. This channel is 7 miles long, 500 feet wide and 41 feet deep. At Gatun there are three twin locks in flight, in which vessels are lifted 85 feet from the sea level, passing into the waters of Gatun Lake. This lake has an area of 164 square miles, is artificial, and has been formed by damming the Chagres River and its tributaries. The dam is at the side of the Gatun Locks, where a break in the range of hills existed which surround the basin of the Chagres. It is a mile and a half long across the gap, and 2,100 feet, or about half a mile, thick at the base, 400 feet thick at the water line, and 100 feet wide at the crest. The top of the dam is 105 feet above sea level, and 20 feet above the surface of the water of the lake. There is a spillway located about midway of the dam, built into a natural hill which stood at an elevation of 110 feet above sea level. This hill was solid rock, so a channel 300 feet wide was cut through it and lined with concrete and a dam built across the head of this channel to form the spillway, or regulating works, for Gatun Lake. Gates are placed on the top of the dam to control the level of the lake. Water can be discharged from the lake, either over the top of these gates at an elevation of 87 feet, the height of the crest of the gates when closed, or, by raising the gates, the water can be discharged under them and over the concrete portion of the dam, at an elevation of 69 feet. At the end of each rainy season, the gates will be closed and the lake level increased from 85 to 87 feet. When the rainy season begins the gates will be raised, allowing the water to escape below them, at an elevation of 69 feet, thus completely controlling the flow of the Chagres River.

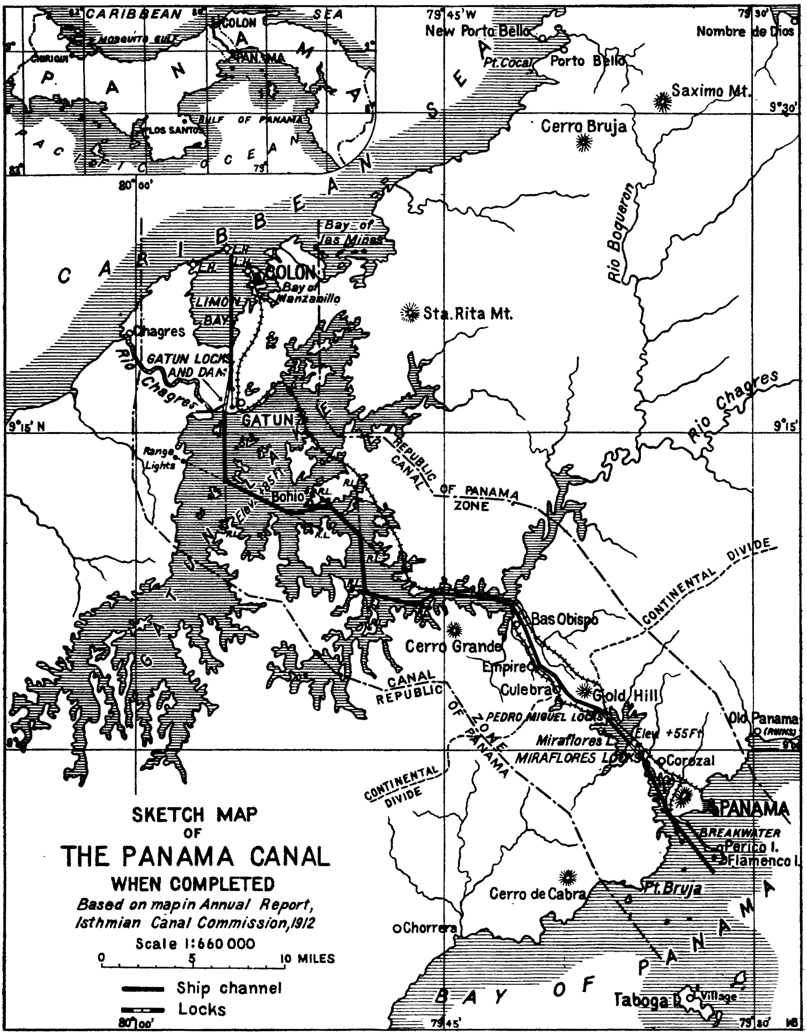
The surface of Gatun Lake stands 85 feet above sea level, the summit level of the canal, and extends from Gatun through the Culebra Cut to the southern end at Pedro Miguel, a distance of 32 miles. The surface of the water throughout this artificial lake will be the same, but the depth will vary. The great cut at Culebra, making a part of the lake, is made at just sufficient depth to enable vessels of the largest tonnage to pass in safety. A vessel may steam at full speed through this lake in a channel varying from 500 feet to 1,000 feet in width, the depth varying from 45 to 85 feet, for a distance of 24 miles, from Gatun to Bas Obispo, where it will enter the Culebra Cut. It will pass through the cut at a reduced rate of speed, a distance of nine miles, in a channel with a bottom width of 300 feet, to Pedro Miguel Lock, at the south end of the lake, through which vessels are lowered in one step from the 85 feet above sea



Churn or well drills working in Culebra Cut opposite Contractors Hill.



Culebra Cut, showing a section of the large slide, February, 1913.



SKETCH MAP OF THE PANAMA CANAL WHEN COMPLETED

Based on map in Annual Report, Isthmian Canal Commission, 1912

Scale 1:660 000

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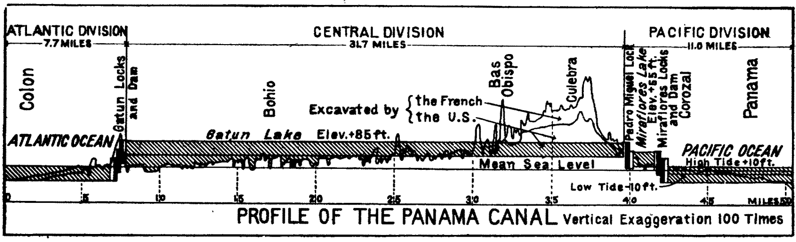
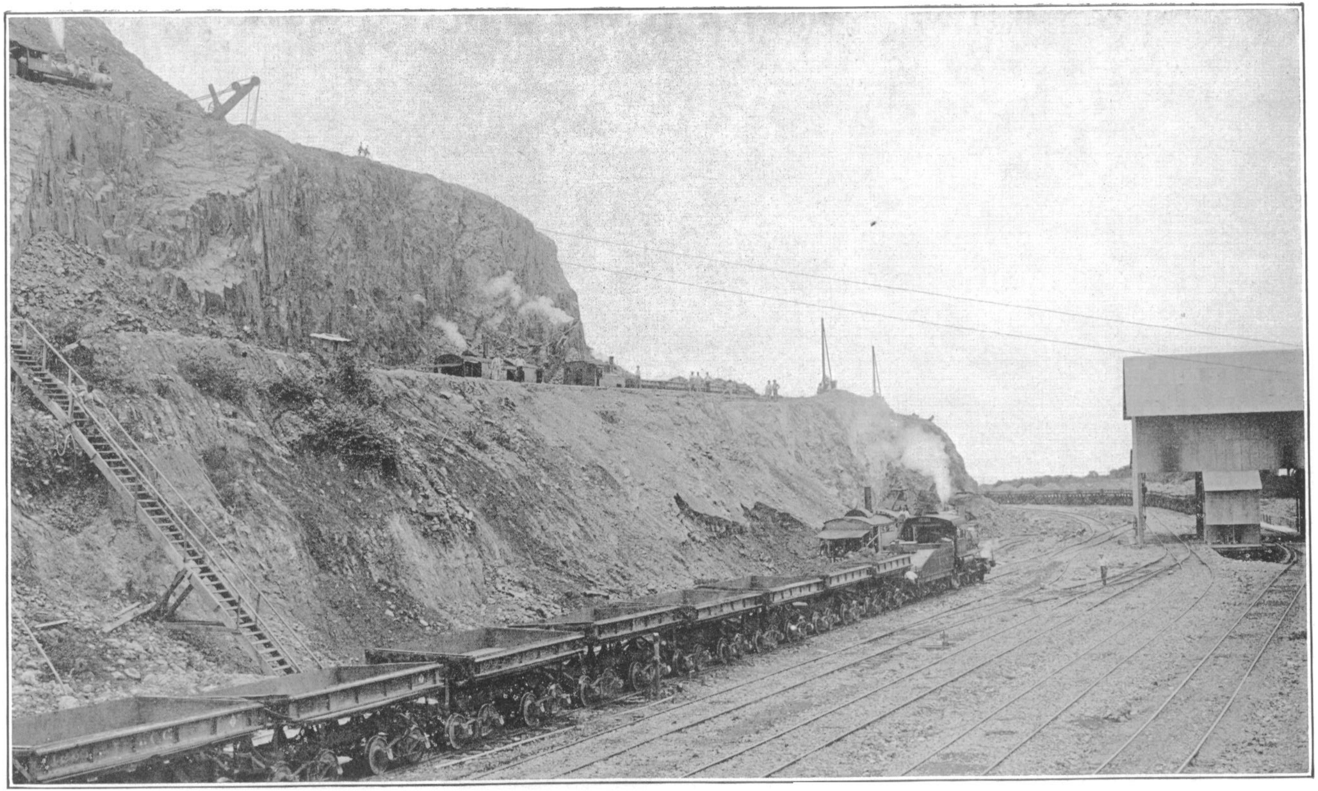
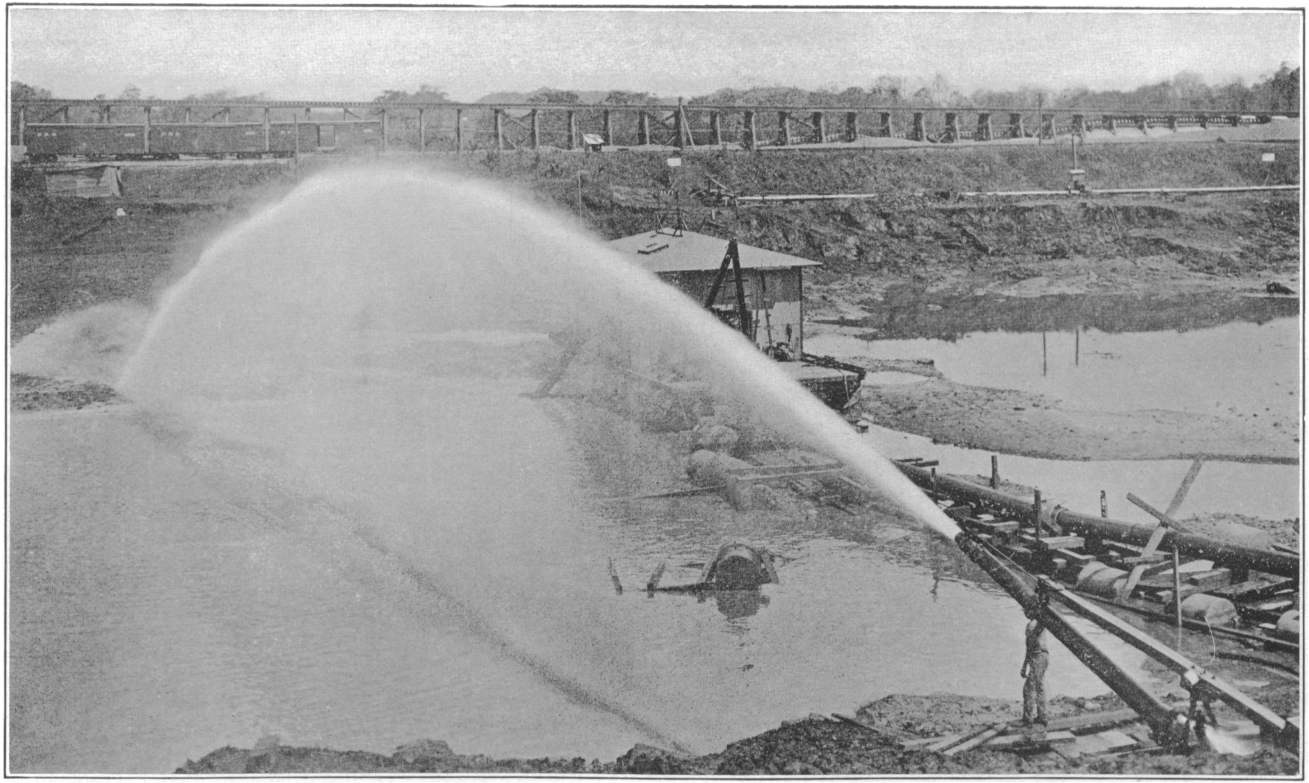


PROFILE OF THE PANAMA CANAL Vertical Exaggeration 100 Times level to 55 feet above, a drop of 30 feet, passing out into Miraflores Lake, a small artificial lake covering an area of about two square miles. This lake is formed by impounding the water of the Cocoli, the Rio Grande and the Pedro Miguel Rivers by means of the dam, locks and spillway at Miraflores. The dam at this point runs parallel to the locks, instead of at right angles to them. This is done for the purpose of taking in the Cocoli River. Passing through Miraflores Lake, a distance of a mile and a half, through a channel 500 feet in width at the base, vessels arrive at Miraflores Locks and pass down through two locks in flight from 55 feet above sea level to the sea level channel on the Pacific side, and thence under full speed to deep water in the Pacific, eight miles distant. The time for passing through from one ocean to the other will be from ten to twelve hours, according to the speed and draft of the vessel. Three hours of this time will be taken up in passing through the six locks. All vessels are required to go through the locks in tow of electric locomotives running on tracks with center cog rails. There are two locomotives in front, one on each side to tow, and two in the rear to retard. Should a vessel come within what is regarded as the danger line to the gates of the lock, it would encounter a chain stretched across the entrance to the lock chamber. This chain is held in place by powerful hydraulic cylinders, located inside of the lock walls. The pressure from these cylinders causes the chain as it plays out to offer more and more resistance to the motion of the vessel. It is said to be capable of stopping within 70 feet a ten-thousand-ton vessel running four miles an hour. After the electric locomotives are attached this protective chain drops into a groove, permitting the boat to pass safely over it.

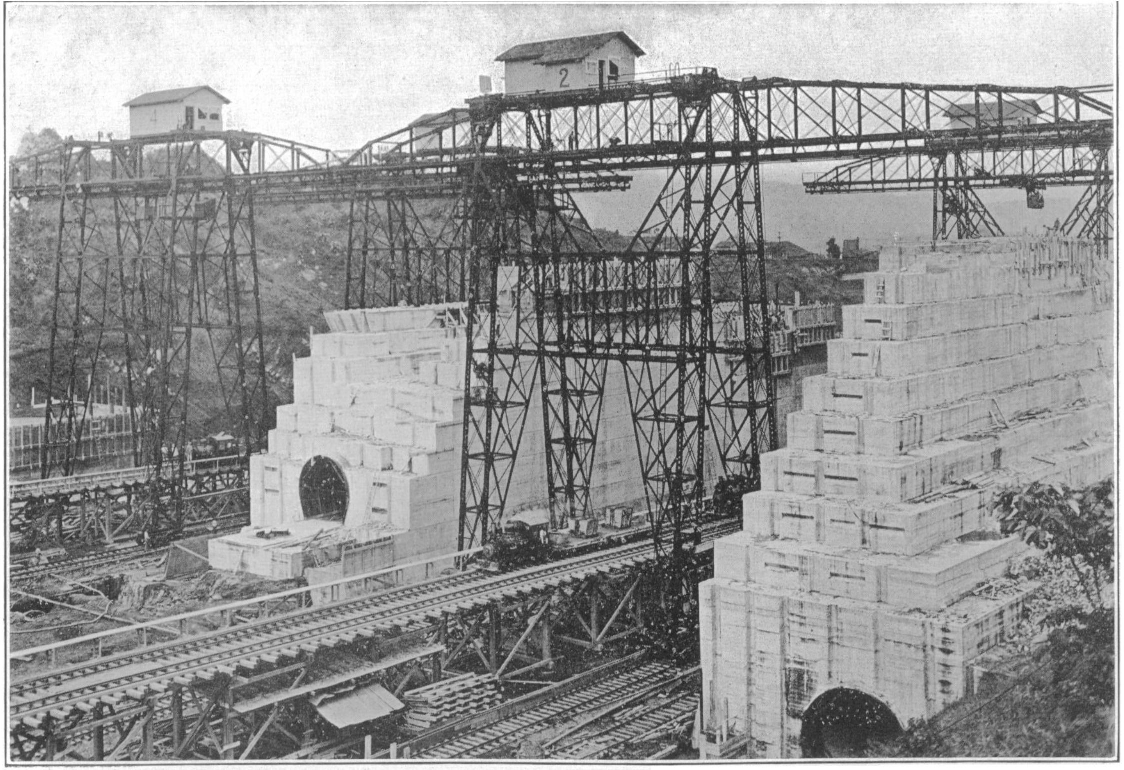
Construction of the Canal. One can have only a very imperfect conception of the magnitude of the work involved in the building of the Panama Canal without going over the ground and witnessing its operation. The largest cut is at Culebra, a distance of nine miles, through igneous rock deposited in loose beds of clay and soft sandstones. This peculiar formation causes the slides which have proven so troublesome and expensive. The average depth to which it was necessary to excavate below the natural surface was 120 feet, through the entire length of the cut. The width of the bottom is 300 feet, widening as the slopes extend upward. At the level where the continental divide was made, between Gold Hill and Contractors Hill, the excavation runs 375 feet in depth, the slopes being in places over 600 feet. The photographs facing pages 244, 245 and 247 will give the reader a slight idea of the length and



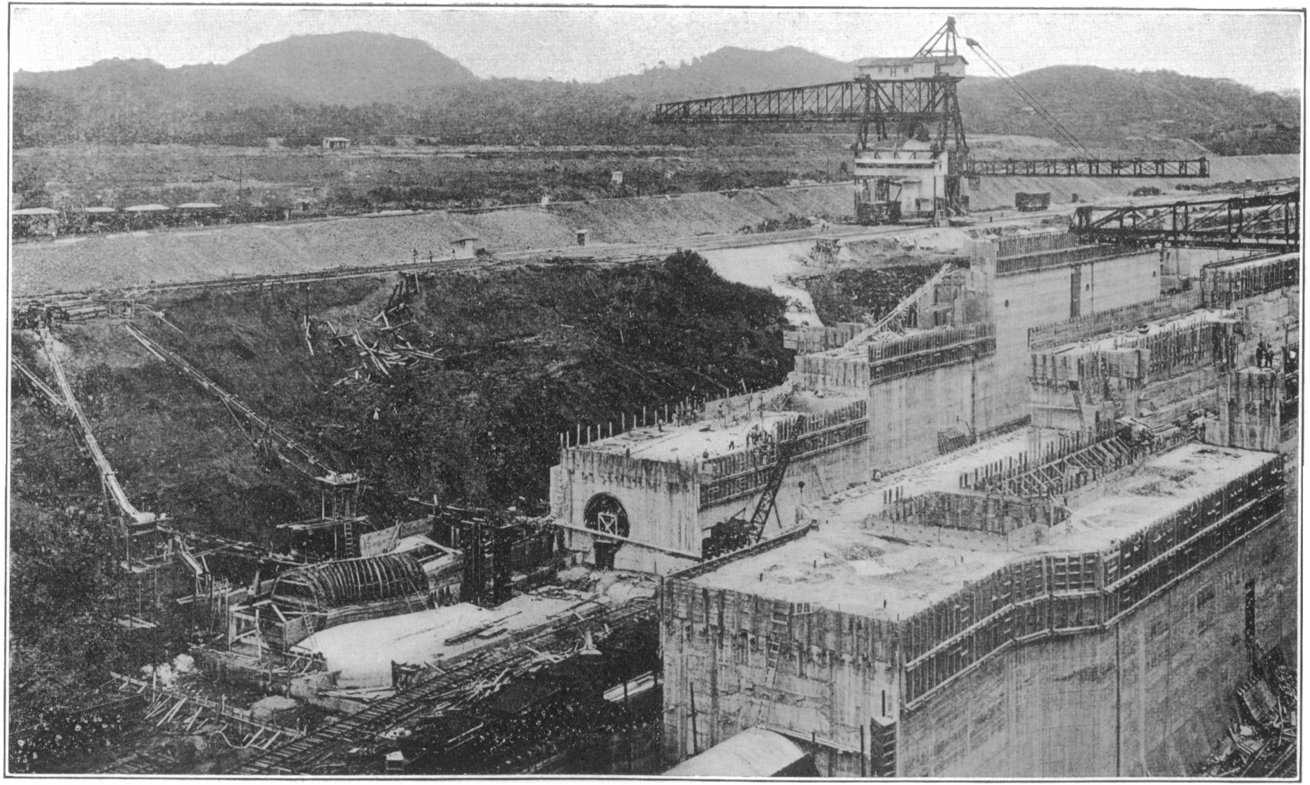
Ancon quarry, showing levels.



View of Miraflores, showing a monitor at work.



View showing all the chamber cranes in Pedro Miguel locks.



Showing center and west walls, lower locks, Miraflores.

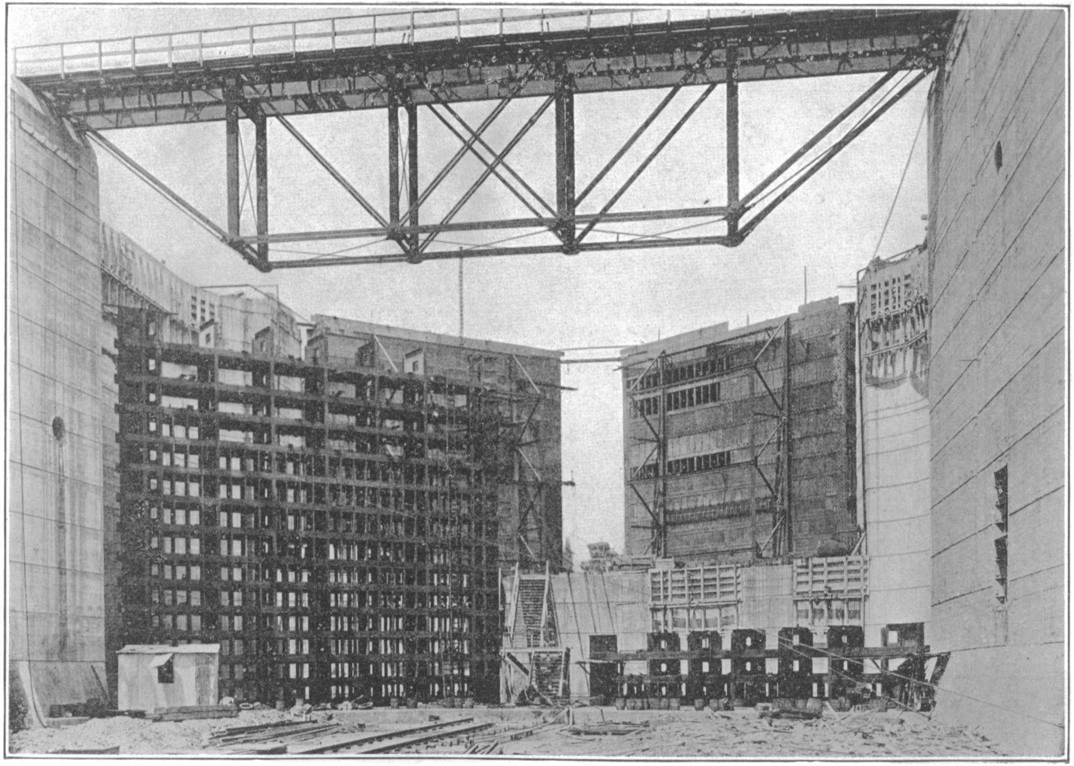
breadth of this great cut. The estimated total excavation was 185,000,000 cubic yards, of which 172,000,000 cubic yards had been removed by September 1, 1912. From time to time slides into the Culebra Cut have added to the material to be excavated. There are in all twenty-one slides along the Culebra Cut. Twelve cover areas varying from one to forty-seven acres, and nine cover areas less than one acre each, making in all an area of one hundred and forty-nine acres. We have space for description of only the largest slide known as the Cucaracha slide, on the east side of the canal. It covers an area of forty-seven acres and has broken back 1,820 feet from the center line of the canal. This slide, according to the French records, began in 1884, and has been the source of considerable trouble to the Government forces. Over 2,000,000 cubic yards have been added to the excavation by this slide since the work was undertaken by the United States, and it is still active. Before the recent slide took place it was estimated that less than ten million cubic yards remained to be excavated. In the year 1911, 16,600,000 cubic yards were excavated, so that there now remains less material to be taken out than was removed last year. Forty steam shovels are at work excavating this material, each one taking out an average of 1,500 cubic yards per day. As a matter of fact, the steam shovels can work only six hours a day, as the transportation facilities will not admit of unloading the cars any faster. There are seventy-five miles of track in the cut, of which it is necessary to move about a mile each day. I was told that 150 was the average number of loaded trains of earth that passed out of the cut each day, or about one every three minutes. The monthly output from the cut alone reaches close to 1,500,000 cubic yards.

It may be interesting to know that the buckets used on the steam shovels load four to five cubic yards at a time, each shovelful weighing from six to seven tons, and four shovelfuls filling a car. All of the material which is excavated in the cut, excepting the slides, is first drilled and then blasted, before it can be handled, and drills are kept constantly at work, as shown in the picture facing page 246. These drills are operated by compressed air from one long main paralleling the cut. Three compressor plants do the work. The average depth to which the holes are drilled is 24 feet, and after drilling to this depth a small charge of dynamite is placed in the hole and discharged by a magneto battery. This enlarges the bottom of the drilled hole. After the hole has cooled, it receives the large charge of dynamite, varying from 75 to 200 pounds to each hole. This charge for effectiveness is exploded by means of the regular electric light current, the other having been found unreliable. Each month an average of seventy-five miles of drilled holes are sunk. It is stated that "if all the drill holes which have been put down since the United States has been at work were placed end to end the hole would pass entirely through the earth, coming out in the Indian Ocean south of the Island of Sumatra." There are over 800,000 pounds of dynamite used each month on the canal.

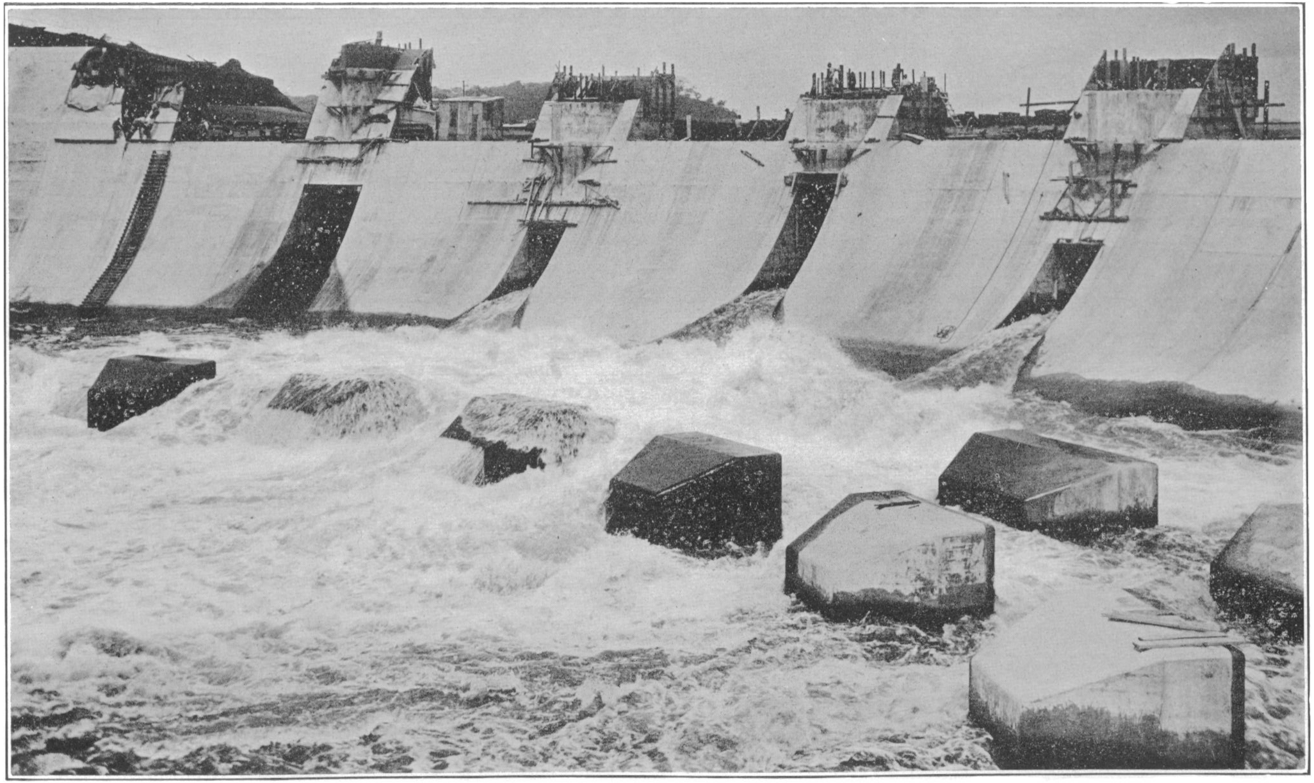
It would be impossible to unload the construction cars in the ordinary way. The work has been facilitated very much by the use of plows, operated by a cable upon a winding drum. The average load of a train of flat-cars, in hauling the mixed material known as "the run of the cut," is 610.7 tons (based on a 20-car train), of a train of large dump cars, 737.68 tons. The average time consumed in unloading a train of flat cars is from 7 to 15 minutes. The dump cars take longer, ranging from 15 minutes, if by compressed air of the locomotives, to 56 minutes, when done by hand. I counted as many as thirty trains loaded waiting their turn to unload at the Balboa terminal. In order to bring the immense amount of earth which will have been excavated at the completion of the work within one's comprehension, it may be well to make another comparison. If the material taken out by the United States, and also the 30,000,000 cubic yards of useful French excavation were loaded on one train of flat cars, similar to those used on the work, it would make a train 96,000 miles long, reaching practically four times around the earth.

The canal force consists of the "gold" force, made up of officials, clerical help, construction men and skilled artisans, 5,347 in number, and the "silver" force, representing the unskilled laborers, to the number of 35,232, a total of 40,579. There are in operation at the canal 100 steam shovels, 158 American locomotives, 112 French locomotives, 13 narrow gauge American locomotives, and 12 electric locomotives, making a total of 315 locomotives. There are 560 drills and 4,346 cars.

It will be seen that in prosecuting the present work provision must be made for an army of employees. The Quartermaster's Department consists of two branches, "Labor and Quarters" and "Material and Supplies." It houses and feeds this army of 40,000 men. The material and supply branch carries in eight general storehouses a stock of supplies valued at between four million and five million dollars. About $12,000,000 worth of supplies are purchased annually, requiring the discharge of one steamer each day.



Erecting upper guard gates and upper lock gates, west chamber, Pedro Miguel.



Discharge at Gatun spillway.

The commissary system consists of 22 general stores in as many canal zone villages and camps. It is estimated that with the employees and their dependents there are 65,000 daily supplied with food, clothing and other necessaries.

The photographs on the preceding pages will give the reader an idea of the size, the length and breadth of the canal locks. There are six locks in the canal, three in flight at Gatun, one at Pedro Miguel, and two in flight at Miraflores. All locks are connected in pairs so that vessels can go in opposite directions at the same time. Each lock, or flight of locks, is reserved for ships going in one direction, the twin lock, or flight, being used for vessels going in the opposite direction. The length of the lock chamber is 1,000 feet, and the depth of the water over the sills is 41⅔ feet in fresh water and 40 feet in salt water, the difference being due to the greater buoyancy of the salt water.

There has been much controversy over the merits of the two different plans of constructing the canal. Many good engineers favored the sea level canal, among them nearly all the foreign engineers whose opinion was consulted when the United States took over the canal from the French Company. The American engineers, quite as eminent and largely in the majority, on the other hand, advocated the lock type of canal. The chief objection to the sea level canal was the enormous quantity of material that would have to be excavated and the tremendous cost of making a canal deep enough for vessels to pass through from ocean to ocean. It would mean an additional excavation of the entire length of the canal inside the locks, about forty miles, to a depth of 85 feet below the present level of the canal. While it is regarded as a possible engineering feat, the greater cost and longer time that would be required to do it precluded its adoption.

I find that an erroneous impression exists as to the level of the two oceans at the Isthmus, to the effect that the Pacific Ocean at that point stands at a higher level than the Atlantic, and that this presents an unsurmountable obstacle to building a sea level canal. As a matter of fact, the mean sea level of the two oceans at the Isthmus is exactly the same. By mean sea level is meant the point midway between extreme high and low tide. The difference is all in the tides. There is an average tide range on the Atlantic at the Isthmus of but 20 inches, while on the Pacific it is 20 feet. The high tide on the Pacific is due to the shape of the Bay of Panama, which, being shaped like a funnel, tends to exaggerate the action of the tide. The same thing occurs in several other places, notably in Puget Sound and the Bay of Fundy.

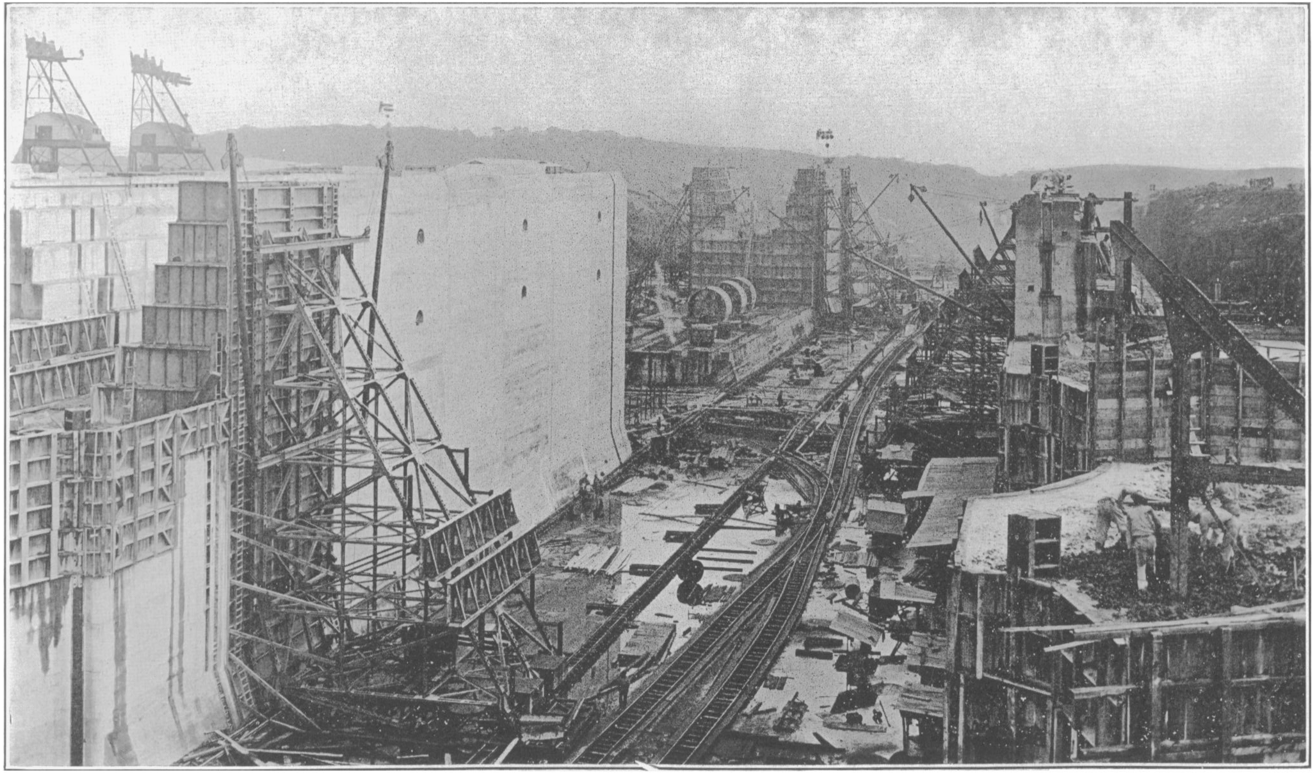
Effect on Commerce. No American can contemplate this magnificent work without a feeling of intense pride in his country and the men who are building this great monument to the glory of the nation. No public utility has ever been built that compares with it either in the magnitude of the work or in the extent of its effect on the commerce of the world. Its immediate effect will be to extend the coast line of the United States to the Isthmus of Panama. President Hayes, in 1879, stated that "An inter-oceanic canal across the American Isthmus will essentially change the geographic relations between the Atlantic and Pacific coasts of the United States and between the United States and the rest of the world." One has but to glance at the map of the American hemisphere to be impressed with the wonderful economies of time and distance that will be accomplished by this new passage between the oceans of the world.

Colquhoun wrote in his "Key to the Pacific," "It will bind together the remote sections of that immense country, assimilate its diverse interests, go far towards solving many difficult problems and make the United States still more united. . . . No greater impulse to commerce can be given than this complement to the Suez Canal. It will benefit America in an infinitely greater degree than Europe. . . . It will give an immense impetus to United States manufactures, especially cotton and iron, and will greatly stimulate the shipbuilding industry and the naval power of the United States."

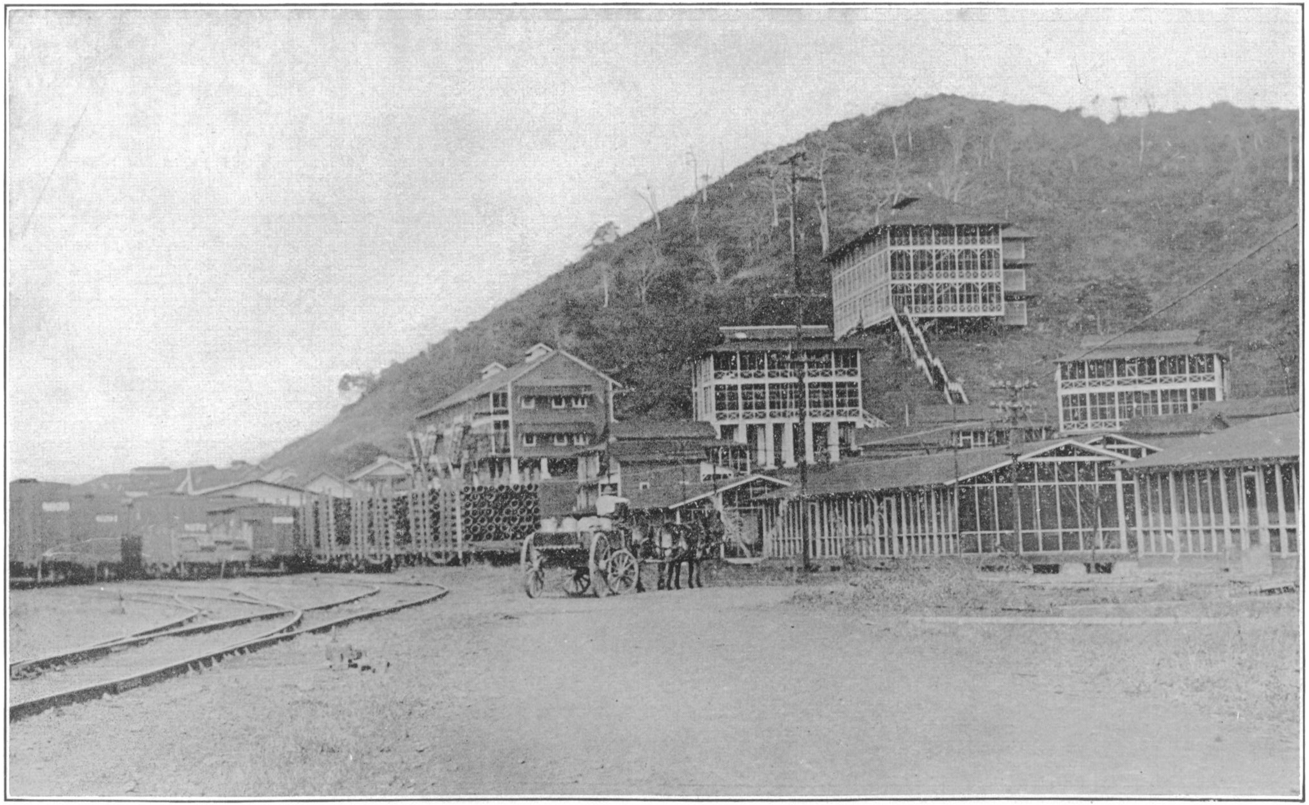
The United States will undoubtedly be more largely benefitted by the canal than any other country.

The chief products of the Southern States are cotton, iron and coal. The opening of the canal will give a tremendous impetus to the trade in these manufactures all along the Pacific coast. Nowhere in the world can iron be produced cheaper than in Alabama. The iron machinery and hardware of Birmingham and the steel of Tennessee will be found in increasing demand all along the Southern coast. The rapid increase in cotton manufacturing in Japan will receive additional momentum. The coarse cotton fabrics manufactured by the many mills in North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana and Texas are particularly suitable for use in the Central and South American states, Asia, Hawaii and the Philippine Islands.

The South will have a shorter and easier route either by way of



East chamber, upper lock, Gatun.



Homes of the employees. They dot the hills and higher places all along the line of the canal.

the Mississippi River from New Orleans, or from the many ports on the Gulf of Mexico directly to Colon than any other section of the country. The shorter route, lower freight, quicker delivery, must all conduce to increase business and improve trade. Coal is another great industry in the South that will be highly stimulated by the opening of the great canal.

Panama is destined to become the largest coaling station in the world. Only a change in the fuel for the propulsion of boats can prevent it. The coal from West Virginia, Kentucky, Tennessee and Alabama will find a ready market at Panama.

The industries of the Eastern and Northeastern States are more varied than those of the Southern and Pacific States. Everything almost that is used anywhere in the world is manufactured within a radius of five hundred miles, taking Pittsburg as a center. The manufactures of iron and steel, of ponderous machinery, implements and tools, electric appliances and apparatus, the finer cotton fabrics, textiles and prints—all the goods that have heretofore gone to the Orient by way of the Suez Canal will now find a route through the Panama Canal.

The Political and Military Effect. The primary purpose of building the Panama Canal was to benefit the commerce of the world, and incidentally to promote our own interests in the countries bordering on the Pacific Ocean. Our people, however, also realized that the time had come when the isthmian passage between the oceans had become a military necessity; that the need of a short route from ocean to ocean was imperative. The journey around Cape Horn by the battleship Oregon to join the Atlantic fleet could not be safely repeated with a hostile fleet on our eastern shore. Without the waterway across the Isthmus of Panama it would be necessary to maintain two squadrons when one of half the size will now suffice. The saving in that item alone will in less than a decade far exceed the expenditure made for the canal.

It will be essential to the safety of this country as well as to the commerce of the entire globe that the canal be protected by those who have built it. The nations of the world perceive the wisdom and commend the justice of our Congress in providing fortifications at each end of the canal for that purpose. There is no provision in the Hay-Pauncefote treaty that precludes, or prohibits it.

While in Panama, our able Chargé d'Affaires, the Acting Minister from the United States, Hon. William W. Andrews, gave a complimentary dinner to the recently elected President of Panama. There were present fourteen diplomatic representatives of other countries. I had the good fortune to be one of the guests, and was assigned a seat between Sir Claude Millett, Minister of Great Britain, and Antonio B. Agacio, Consul-General from Chile. Nearly all of the Central and South American States were represented. I was gratified to hear the many expressions of good will toward our country that were made, the high appreciation felt for the colossal work being done at Panama, the blessings it would confer on the Latin-American republics, the boon that it would prove in introducing that part of the world to modern civilization, and the improved social conditions sure to follow. I was surprised to find that they regarded it as principally a philanthropic work, undertaken by the greatest nation of the world for the benefit of mankind. All agreed that only the United States was equal to the task of its construction.

In a little while the thought and hope of the world for four hundred years will have become an accomplished fact. The two continents of the Western Hemisphere will have been cut in twain. What changes have transpired since Spain first conceived the possibility of this waterway! Then our country was a wilderness; to-day it is a center of learning, art, manufacture, science, commerce and finance. Spain, then in the zenith of her glory, the splendor of her courts the surprise of the world, invincible on sea and land, has seen almost all her possessions fall away from her. While we contemplate her condition with sympathy, we are not unmindful of the part she took in the discovery of the new world and that it was she who first expressed the wish to do what has come to be entrusted to us.

It is a remarkable coincidence that the canal will be built and the work completed just 100 years after the Cortes of Spain passed the bill authorizing the construction of a passage across the Isthmus of Panama and four hundred years from the discovery of the Pacific Ocean by Balboa.